
Method for producing a coloured sand composition, and composition thereof

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Patent claims

1. Method for producing a coloured sand composition containing a large number of silica sand grains with outer coatings of colour pigments, characterized by
10 the following steps:
 - mixing caustic soda and water in a predetermined ratio, preferably of 1:2, to form a dilute caustic soda;
 - mixing boric acid in a predetermined concentration with the dilute caustic soda to form a boric acid/caustic soda solution;
 - 15 - mixing a binder, in particular sodium water glass, with the boric acid/caustic soda solution in a predetermined ratio to form a coating mixture;
 - coating the silica sand grains coated with the colour pigments with the coating mixture by adding the coating mixture to the silica sand grains, and
 - indirectly heating the silica sand grains coated with the coating mixture in a system
20 which is spatially sealed from the heating source by means of separate chambers for the heating process and the heating source.
2. Method according to Claim 1, characterized in that
25 the indirect heating of the silica sand grains is carried out without adding gases, in particular CO₂ gases, in the chamber of the heating process at a temperature within a temperature range of 300°C – 900°C, preferably 450°C – 550°C.
3. Method according to Claim 1 or 2, characterized in that,
30 in the step of mixing caustic soda with water, the caustic soda is stirred into the water and dissolved therein.
4. Method according to any of the preceding claims,

characterized in that

the step of mixing the boric acid with the dilute caustic soda is carried out only following the elapse of a cooling period in which the dilute caustic soda, which has been considerably heated by the previous mixing step, is cooled.

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5. Method according to any of the preceding claims, characterized in that the boric acid/caustic soda solution has a boric acid content of 35.7% by mass and a density of 1.4 – 1.6 g/cm³.

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6. Method according to any of the preceding claims, characterized in that the boric acid content in the boric acid/caustic soda solution is such that the boric acid is only partially neutralized by the dilute caustic soda and 1 – 2 free protons are produced per boric acid molecule.

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7. Method according to any of the preceding claims, characterized in that the ratio of boric acid/caustic soda solution to sodium water glass is in a range from 1:2 – 1:6, and is preferably 1:3.6.

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8. Coloured sand composition containing a large number of silica sand grains with outer coatings of colour pigments, characterized in that the surface layers baked onto the silica sand grains consist of a coating mixture which contains caustic soda and water in a predetermined ratio, boric acid in a predetermined concentration, and sodium water glass.

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9. Coloured sand composition according to Claim 8, characterized in that the ratio of caustic soda to water is selected from a range of 1:1 – 1:5, and is preferably 1:2, wherein the caustic soda and the water form a dilute caustic soda.

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10. Coloured sand composition according to Claim 9,

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characterized in that

the boric acid is mixed with the dilute caustic soda in a ratio within a range of 1:1 – 1:5, preferably 1:1.8, to form a boric acid/caustic soda solution.

5 11. Coloured sand composition according to Claim 10,

characterized in that

the boric acid/caustic soda solution is mixed with the sodium water glass in a ratio within a range of 1:1 – 1:6, preferably 1:3.6, to form the coating mixture.

10 12. Coloured sand composition according to any of Claims 8 – 11,

characterized in that

the sodium water glass has a SiO_2 content of 27.3% by mass, a Na_2O content of 8.2% by mass and a H_2O content of 64.5% by mass.

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